September 22, 2010 – DRAFT

Adopting a Single Zone State Plane Coordinate System: A Call to Action

The state should adopt a single zone for its state plane coordinate system for efficiency and accuracy. Various states have adopted single zones since the State Coordinate Plane Coordinate System of 1983 (SPCS 83) was enacted.

The state should begin the process to add the new zone. With executive sponsorship, the state should request changes to the National Geodetic Survey (NGS) and state policies. NGS helps notify GIS communities and technologies.

Projected Impacts

Minimal implementation costs expected. The new single zone would be an addition to existing north and south zones and used primarily for new statewide maps.

Key Findings

- Oregon, Kentucky, Pennsylvania, and Illinois adopted a single zone after SPCS 83 was enacted.
- Michigan, Montana, Nebraska, South Carolina, Puerto Rico and Virgin Islands went to a single zone when SPCS 83 was updated to supersede the first SPCS developed in the 1930s.
- State Geographic Information Councils helped some states lead sponsorship and adoption. States then made or are submitting statutory changes to codify single zones.
- States worked with and submitted single zone proposals with adopted coordinates to the National Geodetic Survey (NGS).

Recommendations

- The state should consider adopting a single zone for its state coordinate system with the leadership of the Department of Natural Resources (DNR) and update related policies.
- The state should identify and request executive sponsors, such as the Washington Geographic Information Council (WAGIC), Information Services Board GIT Committee, Land Surveyor's Association of Washington, and other primary stakeholders.
- Upon stakeholder endorsement, the state should submit a requested change to the National Geographic Survey (NGS) and notify ESRI, the state's primary GIS software partner.
- The state should begin the process to revise Washington's RCW 58.20 statute within the 2011 Legislative Session or supplemental session.

Why Adopt a Single Zone for Washington State?

Currently, statewide maps are distorted for areas in the north half of the state. The distortion is caused by using Washington South Zone coordinates projected north to the Canadian border for statewide maps. South Zone coordinates are used for statewide map projections per state GIS standards.

The Washington Single Zone would provide less statewide map distortion (see Appendix A). It would provide more overall accuracy and less percentage of computational error than the current method of projecting Washington South Zone coordinates to the northern border of the state (see Appendix B).

What are projected costs and efforts?

Minimal implementation costs expected. The new single zone would be an addition to existing north and south zones and used primarily for new statewide maps. Existing GIS data would not be impacted.

NGS helps update and communicate changes. NGS publishes changes to state plane coordinate systems (SPCS). Leading software vendors and states are notified through NGS. As such, the Washington Single Zone would be available within GIS and other technologies for data exchanges and statewide map projections.

Background

Where possible, states have moved to single or a reduced number of zones for efficiency and accuracy. The need for geospatial data and systems for maps continues to grow as does the need for maps that cross political subdivisions such as county boundaries.

States That Adopted Single Zones

Various states have adopted single zones. Some states adopted single zones when NGS published SPCS 83. Other states have since adopted for efficiency, accuracy, and ease of use.

States that adopted a single zone after NGS published SPCS 83

- Oregon, Kentucky, Pennsylvania, and Illinois

States and Possessions that adopted a single zone when NGS published SPCS 83

- Michigan, Montana, Nebraska, South Carolina, Puerto Rico and Virgin Islands

The State Plane Coordinate System

The State Plane Coordinate System (SPCS) was designed for large-scale mapping in the United States. First developed in the 1930s to provide a common reference system for surveyors and map makers, it was updated and revised in 1983 for accuracy and advances in technologies.

Coordinate systems are designed to project portions of a 3 dimensional, spherical earth onto 2 dimensional maps and computer screens. Common SPCS projection systems include:

- *Lambert Conformal Conic* - for states that are longer east to west, like Washington and Oregon; and
- *Transverse Mercator* - for states that are longer north to south, like Wisconsin and Vermont

States have one or more coordinate zones, and some use one or more projections.

Related Statues and Standards

Washington Coordinate System, Chapter 58.20 RCW
http://apps.leg.wa.gov/rcw/default.aspx?cite=58.20

ISB GIT Standards for Horizontal Datum and Coordinate Systems
http://isb.wa.gov/policies/601s.doc

REFERENCES

State Plane Coordinate System of 1983, NOAA
http://www.ngs.noaa.gov/PUBS_LIB/ManualNOSNGS5.pdf

Kentucky
http://gis.ky.gov/standards/kyspcs.htm

Oregon
http://www.oregon.gov/DAS/EISPD/GEO/coordination/projections/projections.shtml

Michigan
http://www.michigan.gov/documents/DNR_Map_Proj_and_MI_Georef_Info_20889_7.pdf

Nebraska
http://www.dnr.ne.gov/databank/metadata/geod_doc.txt

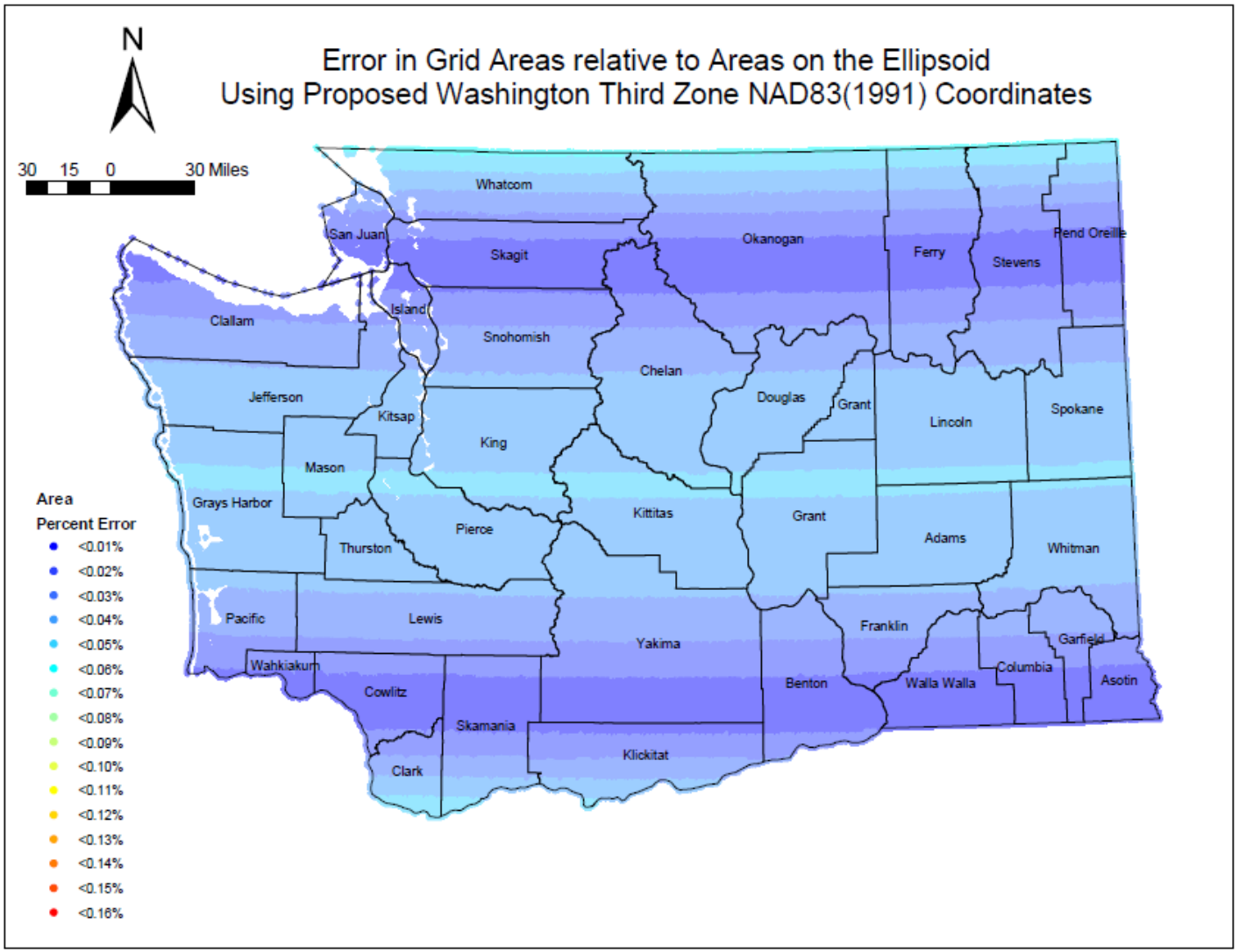
South Carolina
http://ors.sc.gov/geodetic/stateplane.html

Information Services Board (ISB) Geographic Information Technology (GIT) Committee
http://isb.wa.gov/committees/git/Default.aspx

Washington State Geographic Information Council (WAGIC)
http://wagic.wa.gov/

Land Surveyor's Association of Washington
http://www.lsaw.org/

Appendix A – Proposed New Single Zone: Area Percent Error



Appendix B - Existing Single "South" Zone: Area Percent Error